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ABSTRACT

This study examined the relationship between adult physical activity levels and patterns of activity that were established during childhood. A random digit telephone survey was conducted of noninstitutionalized residents in a medium sized California city. Subjects ages 18 and over who volunteered to participate were questioned about their involvement in both formal and informal leisure-time physical activities during their childhood and teen years. Self-reported adult levels of aerobic activity were recorded along with reasons for participation in physical activity for all three time periods. Relevant demographic data were also collected. The results indicated that aerobically active adults were significantly more likely to have participated in organized physical activities during childhood. They were also significantly more likely to have been involved with informal physical activities during high school. Self-evaluation of athletic ability during childhood was significantly more favorable among those children who became aerobically active adults. (Author)

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Relationships Between Childhood and Adult Physical Activity Patterns in a Community Sample

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Abstract

This study examined the relationship between adult physical activity levels and patterns of activity that were established during childhood. A random digit telephone survey was conducted of noninstitutionalized residents in a medium sized California city. Subjects ages 18 and over who volunteered to participate were questioned about their involvement in both formal and informal leisure time physical activities during their childhood and teen years. Self-reported adult levels of aerobic activity were recorded along with reasons for participation in physical activity for all three time periods. Relevant demographic data were also collected.

Aerobically active adults were significantly more likely to have participated in organized physical activities during childhood. They also were significantly more likely to have been involved with informal physical activities during high school. Self-evaluation of athletic ability during childhood was significantly more favorable among those children who became aerobically active adults.

Relationships Between Childhood and Adult Physical Activity Patterns in a Community Sample

Results from the National Children and Youth Fitness Study II (Zylke, 1988) focused national attention on activity patterns and fitness levels of children. Completed in the mid 1980s, this study measured cardiorespiratory endurance, flexibility, muscular strength and endurance, and adiposity in a national probability sample of school age children. Findings indicated that body fat levels have been increasing in children over the last two decades; physical education classes, for the most part, have been inadequate in achieving needed goals; television viewing time has increased as time spent engaged in vigorous exercise has decreased; and the most fit children generally watched less television, participated in community phy al activity programs, and had parents who exercised with them regularly.

Relationship Between Childhood and Adult Physical Activity Patterns

In a study examining correlates of participation in adult recreational sport, Spreitzer and Snyder (1983) concluded that parental encouragement and childhood sports participation influenced adult sports participation. They also suggested that adult participants in sports attained feelings of satisfaction, pride, and competence from their involvement, while adults who did not participate demonstrated less intrinsic satisfaction related to physical activity and lower athletic self-efficacy.

The assertion of Dishman, Sallis, and Orenstein (1985) that determinants of regular exercise are poorly understood suggested a need to examine the reasons for participation in physical

activity. These researchers identified three categories of determinants for exercise: personal factors, environmental factors, and factors related inherently to a specific activity. They concluded that "intention, personal capabilities, behavioral skills, commitment, and reinforcement" were significant determinants of physical activity (p. 168).

Among their recommendations for future research were three suggestions relevant to the present work: (a) investigate the relationship of age to determinants of physical activity, (b) examine differences in determinants of participation in formal and informal settings, (c) study the relationships between exercise history, family or peer influence, socioeconomic level, and age with physical activity.

In a recent report that examined participation in school athletics as a determinant of adult physical activity, Powell and Dysinger (1987) were unable to find published research "devoted primarily to the relationship between childhood and adult patterns of physical activity" (p.276). After reviewing six relevant studies, they concluded that the available data at best are only mildly suggestive of an association between early participation in school athletics or physical education and adult participation in physical activity.

In an earlier review that yielded contradictory findings, Dishman, Sallis, and Orenstein (1985) concluded that there was a "strong relationship between sport play in youth and involvement in organized sports as an adult, especially among women" (p. 164). They suggested that this relationship was much less pronounced between adolescence and adulthood.

Dennison, Straus, Mellits, and Charney (1988) found that childhood determinants of adult physical activity patterns had not been adequately investigated nor had there been published studies which examined the transition from childhood to adult physical activity patterns. Their own research indicated that physical fitness test scores for boys were associated with adult physical activity patterns.

The present exploratory study was conducted to examine some of the gaps suggested in the research literature relevant to the relationship between childhood physical activity and adult physical activity patterns. Specific relationships and variables examined included:

(1) The relationship between physical activity during elementary schools years and adult aerobic activity.

(2) The relationship between physical activity during the teenage years and adult aerobic activity.

(3) The setting for elementary or teenage physical activity (formal vs. informal setting) and its relationship to adult aerobic activity.

(4) The change in physical activity levels during the teen years.

(5) An examination of the determinants of childhood, teenage, and adult physical activity.

Methods

During November 1989, a random digit telephone survey was conducted of 316 noninstitutionalized residents in a medium sized (50,000) California city. Out of the original target population of 316 subjects, 195 (62%) agreed to participate in this

telephone survey. Residents ages 18 and over who volunteered to participate were questioned about their childhood and teenage participation in both formal and informal physical activities. The interviews took 10 to 15 minutes to conduct. Three call backs were made before a phone number was abandoned and interviews were conducted daily during a two week period. This project was approved by the Institutional Review Board at California State University, Chico.

The survey instrument consisted of 21 questions containing primarily dichotomous answer choices (yes/no) concerning participation in formal and informal physical activities as a child, as a teenager, and as an adult. If respondants reported regular participation at any of these levels, they were asked to select reasons for their participation. The list of reasons from which they were allowed to select consisted of those items most often mentioned in the recent literature.

Childhood physical self-efficacy was assessed using a Likert scaled item inquiring about the respondants' personal evaluation of their athletic ability during elementary school years. Answer choices ranged from well above average to well below average on a five point Likert scale.

The literature suggested that the teen years marked a transition from high to low physical activity levels (DeMarco & Sidney, 1989; Stephens, Jacobs, & White, 1985). To investigate this assertion subjects were asked if there were any substantial changes in their physical activity during their teens. Answer choices ranged from a major increase to a major decrease using a five point Likert scale.

Adult aerobic activity was assessed by asking "during a normal week, about how often do you participate in physical activity for at least 20 minutes without stopping which is hard enough to increase your breathing and heart rate a large amount?" This question was adapted from a survey administered by Sallis, Hovell, Hofstetter, and Faucher (1989, p.21).

Demographic information was obtained regarding gender, race, age, education, weight, marital status, parental education, and whether the subject smoked. Potential subjects were prescreened concerning medical conditions which might have precluded them from participation in physical activity during childhood. Subjects who were medically unable to participate in physical activity were excluded from the study.

Results

With the exception of three items, all data generated were categorical in nature (yes/no responses). The question on adult aerobic activity yielded simple frequencies concerning the number of times a respondant exercised aerobically during a normal week. Frequency distributions, crosstabs, t-tests, and chi square tests of association were employed to investigate differences between groups.

Demographically, the sample was 66% female, primarily Caucasian (95%),relatively young (66% were under 40 years of age), highly educated (76% had at least some college training), surprisingly stout (50% average weight, 36% slightly to very overweight), and was comprised of nearly equal numbers of married and unmarried individuals (98 vs. 97).

Findings Related to Childhood Physical Activity

Compared to their more sedentary peers, adults who reported being aerobically active (exercising two or more times per week), were more likely (X^2 =10.91, p=.004, df= 2) to have participated in organized sports or physical activities during their elementary school years.

Reasons for participation in childhood physical activity are presented in Table 1. Enjoyment and socialization patterns associated with childhood physical activity are apparent in choices such as "enjoyment, competition, or excitement" and "to be with friends".

Insert Table 1 about here

In an attempt to examine childhood physical self-efficacy as a determinant of adult physical activity patterns, subjects were asked for their self-evaluation of their athletic ability during their elementary school years. Surprisingly, 49 percent of the sample saw themselves as "somewhat above average" or "well above average", while only 12 percent viewed their athletic ability as "somewhat below average" or "well below average".

Those adults who were aerobically active were more likely (X^2 =12.54, p=.014, df=4) to have viewed themselves as "somewhat above average" or "well above average" in atheletic ability during elementary school.

Findings Related to Teenage Physical Activity

Aerobically active adults were more likely (X^2 =6.28, p=.043,

df=2) to have participated in regular informal physical activities as teenagers. Reasons for participation in physical activity as teenagers are presented in Table 2. Enjoyment and socialization remained important reasons for this age group with "enjoyment" receiving the largest percentage (90%) of affirmative responses. "Improvement of athletic skills or strength" as the second most common reason may be indicative of increasing self-consciousness in this age range.

Insert Table 2 about here

In response to the suggestion that the teen years mark a transition period of reduced physical activity leading to sedentary adult activity patterns, subjects were asked if there were any changes in their activity or exercise patterns during their teen years. Surprisingly, 45 percent reported moderate to major increases in physical activity, while only 19 percent reported a decrease in activity during these years.

A t-test comparing those who increased physical activity during their teen years with the group that either decreased or stayed the same indicated a significant association ($t=2.10$, $p=.037$, $df=186$) existed between increased physical activity during the teen years and a high level of adult aerobic activity.

Adult Activity Patterns

Respondants were asked "during a normal week, about how often do you participate in physical activity for at least 20 minutes without stopping which is hard enough to increase your breathing

and heart rate a large amount?" A response of two or more times per week qualified a subject as "aerobically active". The decision to use two times per week as a minimal criterion was based on suggestions in the literature that two sessions per week might suffice for the attainment of cardiovascular benefits (Dennison et al., 1988). Since 74 percent of the sample met this minimal criterion, it is assumed that a high degree of self-selection may have occurred with inactive adults being more likely to decline to participate in a "fitness" survey. Eighty-four percent of adult exercisers reported that an informal setting was their primary venue for vigorous activity.

Important reasons for adult activity (see Table 3) included physical health, enhanced self-esteem, and enjoyment. Health emerged as an important reason why adults exercise but it is noteworthy that even in adults who are perhaps better able to delay gratification, enjoyment remained a significant reason for participation.

Insert Table 3 about here

In this sample, the only demographic variable significantly related to aerobic fitness was marital status with unmarried respondants more likely (X^2 =7.98, p=.005, df=1) to be aerobically active.

Discussion

Results of this exploratory study are limited by a number of mitigating factors. Selection bias was evident in the high percentage (74%) of respondants who qualified as aerobically

active. The demographic profile (95% Caucasian, 66% under 40 years of age, 76% with at least some college, 64% from childhood households with at least one member who attended college, 82% non-smokers, all California residents) is suggestive of a subsample of the general population which may be more prone to exercise than the norm (Dishman, Sallis, & Orenstein, 1985). Stephens, Jacobs, and White (1985) concluded that "the young and persons of relatively high socioeconomic status are definitely more active than average...this is probably also true of westerners and suburbanites..." (p. 147). One may speculate that the high refusal rate (38%) eliminated a large percentage of non-exercisers.

The retrospective nature of this research may have resulted in a degree of recall bias, particularly among older participants. It has been proposed (Powell & Dysinger, 1987) that active adults may be more likely to recall early athletic activities. In addition, self-reported exercise adherence data are often considered suspect in terms of their validity. The anonymous nature of this survey, however, may have improved the honesty of the reports.

In view of the limitations presented by such a self-selected sample, some tentative conclusions are offered. Data from this survey show a statistically significant association between participation in organized physical activities during childhood and regular adult aerobic activities suggesting the importance of organized physical activities for children during elementary school years. As indicated by the National Children and Youth Fitness Study II authors (Ross et al., 1987), the community may

be the most successful vehicle for providing organized physical activities for children which may predispose them to continue exercising as adults.

An examination of reasons for childhood physical activity indicated that enjoyment ranked highest in the view of children along with socialization (being with friends). Encouragement by parents, teachers, and coaches also played a major role in motivating children to participate in physical activity suggesting that school physical education programs and community efforts need to emphasize enjoyment and socialization within a framework supplying ample adult encouragement and support. Decreased emphasis on competition with a concommitant focus on increased playing time for all children may be an effective strategy for attaining this objective. Organized physical activities do not necessarily have to consist entirely of the traditional competive activities.

The statistically significant relationship between high physical self-efficacy during elementary school and adult aerobic activity indicates the importance of supporting and encouraging children in their athletic endeavors. Providing more opportunities for cooperative, skill-building activites seems warranted.

Aerobically active adults were significantly more likely to have participated in informal physical activities as teenagers. This differed from the statistically significant relationship between formal, organized, physical activities during elementary school and adult aerobic activities. This discrepancy might suggest that young children benefit most from more structured

activities, while older teenagers, who are fast approaching adulthood, may profit more from learning skills applicable to an informal setting. It may also reflect the increasing sense of individuality found among teenagers. This hypothesis is supported by the high percentage (88%) of aerobically active adults in this survey who reported that an informal setting was their primary venue for vigorous physical activity.

Because the majority of American adults do not participate in regular aerobic exercise, it would be instructive to examine the childhood and teenage activity patterns and experiences of sedentary adults. Their reasons for not exercising would provide an interesting comparison with the results of the present study.

An exploratory, cross-sectional study is by design limited in its ability to assess causal relationships. This study was designed to point out potentially fruitful avenues for future examination. It is suggested that longitudinal studies be conducted to investigate the possible causal link between childhood and adult physical activity.

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Table 1

Reasons for participation in childhood physical activities

Reason	% yes (number)
for enjoyment, competition, or excitement	86% (145)
in order to be with friends	82% (138)
was encourgaged by parents, teachers, or coaches	63% (105)
to gain a sense of personal accomplishment	55% (93)
to acquire and improve skills	55% (92)
in order to win games or prizes	39% (65)
for health reasons	16% (27)

Table 2

Reasons for Participation in Teenage Physical Activity

Reason	% Yes (number)
for enjoyment, competition, or excitement	90% (154)
to improve my athletic skills or strength	62% (106)
was encouraged by parents, teachers, or coaches	60% (103)
was encouraged by friends	60% (102)
for social recognition or personal accomplishment	59% (100)
to improve my appearance or control my weight	34% (57)
for relief from stress or other health benefits	26% (44)

Table 3

Reasons for Adult Physical Activity

Reason	% Yes (number)
exercise for health benefits	85% (121)
physical activity helps me feel good about myself	79% (113)
exercise for enjoyment	73% (105)
exercise for weight control	57% (81)
have friends who exercise	51% (72)
exercise as a family activity	18% (26)
exercise on a physician's orders	8% (12)